

## *“To stent or not to stent” debate, and how it can refer to the role of coronary computed tomography angiography in clinical decision-making for stable coronary artery disease*

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Coronary Computed Tomography Angiography (CCTA) is now the fastest and only growing application for computed tomography in the United States, with approximately 500,000 Americans undergoing CCTA each year<sup>1</sup>. On the other hand, this has stimulated professional and public concern about appropriateness of its widespread use.

AHA/ACC Appropriate Use Criteria (AUC) for CCTA from 2006 defined 37 clinical situations where this method was considered appropriate, whereas in 2010 this has extended to 93, demonstrating and obvious growth.

However, although recommendations for CCTA still remain cautious, on the other hand, diagnostic Invasive Coronary Angiography (ICA) is now recommended only if the results of non-invasive testing suggest high likelihood of significant 3-vessel disease, or left main affliction, and also if the patient is willing to accept the possibility of immediate revascularisation<sup>2</sup>. In general, therefore, the AHA/ACC guideline update was less prescriptive than the earlier NICE guideline, perhaps partly because it put less emphasis on the cost efficiency of its recommendations.

Although the indications might vary among different institutions, ICA and CCTA are now being commonly, and widely, used by clinicians to assess anatomic disease burden in pa-

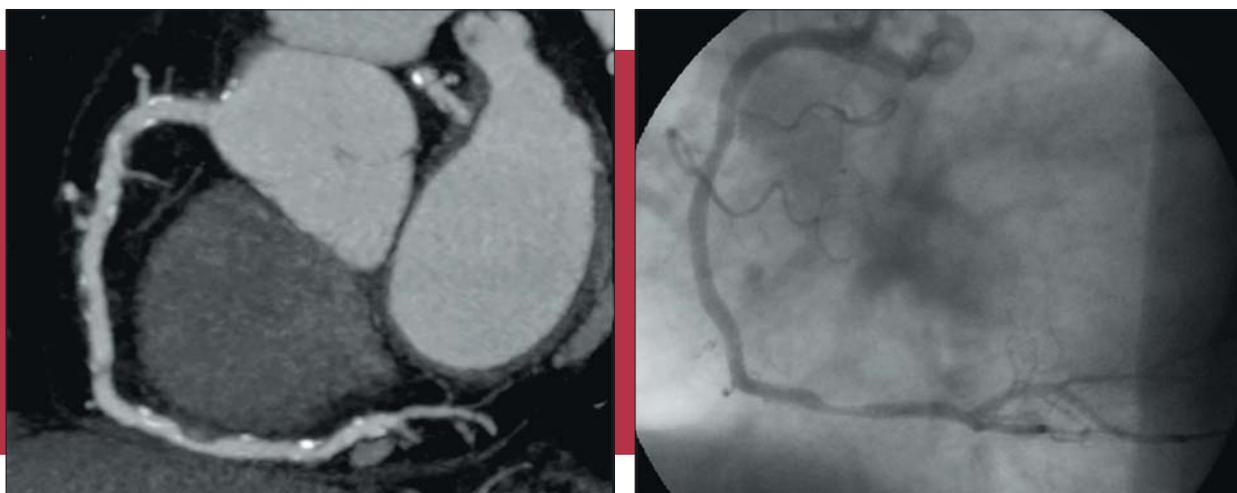
tients with coronary artery disease (CAD), while other non-invasive imaging techniques are primarily used to ascertain ischemic burden.

Beside a recent analysis has de facto called into question the rationale for many of the revascularization procedures performed until recently, at least in patients with stable CAD<sup>3</sup>. In the meta-analysis including more than 5,000 patients, PCI seemed to be no better than medical therapy alone, patients with documented ischemia on stress testing or fractional flow reserve (FFR).

As a curiosity in this respect, when George W. Bush was stented in August 2013 a fierce dispute arose whether this intervention was really necessary or if he would have fared better off with only medical therapy. Also possibly interesting, the primary diagnostic work-up used in his case was CCTA, not ICA.

Luckily, we believe, this dispute was settled after the COURAGE-trial systematically showed that patients with stable angina fare as well with optimal medical therapy alone, as they do with angioplasty/stenting, or by-pass.

In our own series of roughly 800 patients, we also tried to evaluate how CCTA influenced the management and treat-



**Figure 1.** *Coronary computed tomography angiography and invasive coronary angiography. Borderline distal right coronary artery stenosis, on coronary computed tomography angiography and invasive coronary angiography.*

ment of patients with CAD, where we showed that CCTA can reliably replace diagnostic ICA in majority of stable patients, no regardless of the pre-test risk stratification<sup>4</sup>.

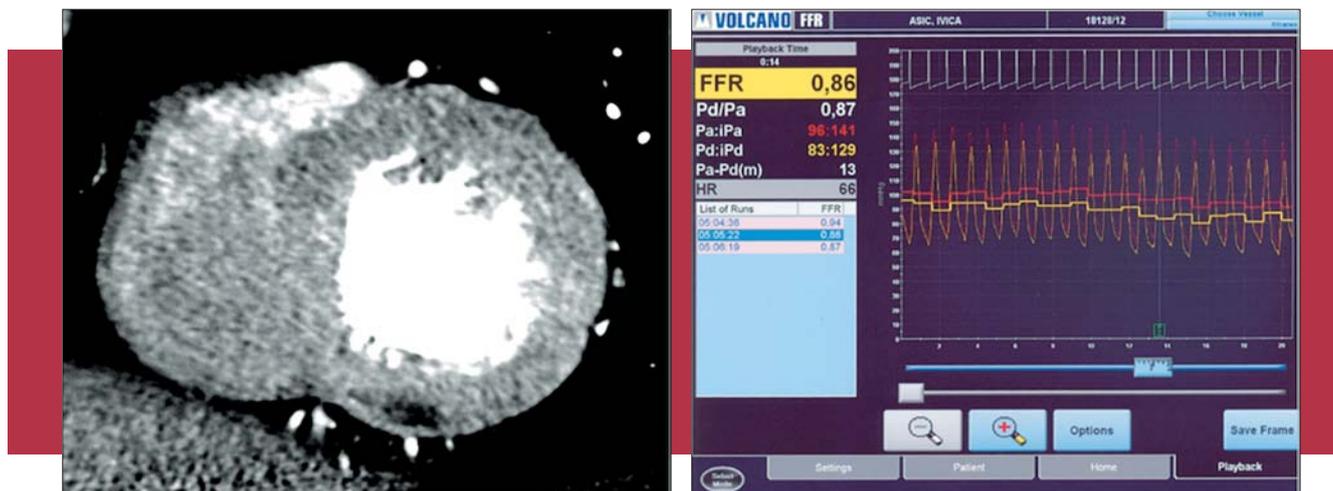
In this respect, we would like to present a case "To stent or not to stent" our own debate (Figure 1 and 2).

Having in mind the most recent evidence-based data that suggests that revascularization (coronary stenting, as well as by-pass) should probably be reserved only for patients with non-stable CAD, while patients with stable CAD should be treated conservatively, we think that also diagnostic

work-up for these patients should be kept as non-invasive as possible, as the majority of the patients can be adequately managed in this way alone.

To conclude, based upon this data and our clinical experience, we believe that CCTA can provide reliable diagnostic and prognostic information for adequate clinical decision-making and treatment of the majority of patients with stable CAD.

The still ongoing 8,000-patient ISCHEMIA and other trials, will hopefully yield some more insights in this respect.



**Figure 2.** Cardiac computed tomography (CCT) and fractional flow reserve. Contrast-enhancement deficit on inferior left ventricular wall (under 10%) on CCT in the same patient, and hemodynamically non-significant stenosis on invasive coronary angiography-fractional flow reserve, which was not regarded to require stenting.

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